

What is claimed is:

1. A vacuum heat treatment furnace comprising a furnace shell, a casing arranged in an inner side of the furnace shell, a heat insulating layer consisting of a thick plate-like alumina-silica series ceramic fiber blanket of multilayer and a thin plate-like alumina series ceramic material arranged in an inside of the casing, and a heater arranged in a heating room surrounded by the heat insulating layer.

2. The vacuum heat treatment furnace as claimed in claim 1, wherein at least one layer in the ceramic fiber blanket of multilayer consists of a board, felt or plate of carbon fiber.

3. An apparatus for measuring a carbon concentration in an atmosphere having a reduced pressure comprising a carbon concentration measuring body insertion port communicating between an external portion of a furnace shell of a heat treatment furnace and a treating room within the furnace shell, means for exhausting an internal portion of the port, means for maintaining a vacuum seal of a portion of the port outside of the furnace shell, means for transferring a carbon concentration measuring body from the external portion of the furnace shell into the treating room, and means for measuring an amount of carbon in the carbon concentration measuring body.

4. The apparatus for measuring a carbon concentration as claimed in claim 3, wherein the carbon concentration measuring body is a carbon concentration measuring steel wire.

5. The apparatus for measuring a carbon concentration as claimed in claim 3, wherein the carbon concentration measuring body is a carbon concentration measuring steel foil.

6. The apparatus for measuring a carbon concentration as claimed in claim 3, wherein the carbon concentration measuring body is a test piece of a subject to be carburized.

5 7. The apparatus for measuring a carbon concentration as claimed in claim 3, wherein means for maintaining the vacuum seal of the portion of the port outside of the furnace shell is means for fastening and holding the carbon concentration measuring body transferring means.

10 8. A method of measuring a carbon concentration in an atmosphere having a reduced pressure comprising the steps of

exhausting an internal portion of a carbon concentration measuring body  
insertion port communicating between an external portion of a furnace shell of a  
heat treatment furnace and a treating room within the furnace shell,

15 transferring a carbon concentration measuring body from a portion of the  
port outside of the furnace shell into the treating room,

reacting the carbon concentration measuring body with the atmosphere in  
the treating room for a predetermined time,

20 gradually cooling the carbon concentration measuring body for a  
predetermined time,

drawing out the carbon concentration measuring body to the portion of the  
port outside of the furnace shell, cooling the carbon concentration measuring body  
to a room temperature, and

measuring an amount of carbon in the carbon concentration measuring body  
in the atmospheric pressure.

9. The method as claimed in claim 8, wherein the carbon concentration measuring  
5 body is a carbon concentration measuring steel wire.
10. The method as claimed in claim 8, wherein the carbon concentration measuring  
body is a carbon concentration measuring steel foil.
- 10 11. The method as claimed in claim 8, wherein the carbon concentration measuring  
body is a test piece of a subject to be carburized.